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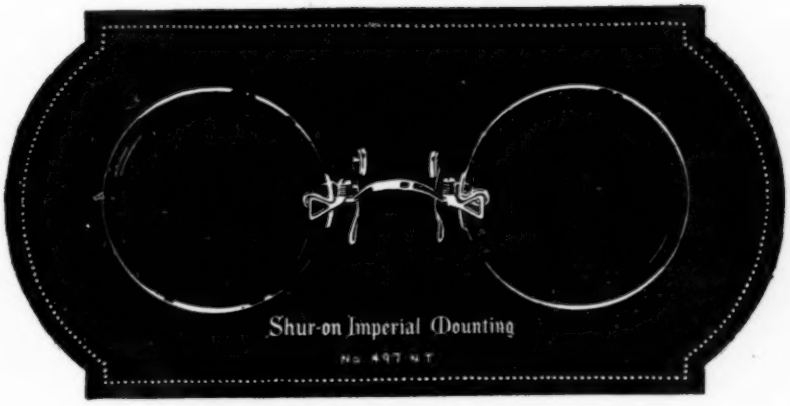

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TINTED LENSES AND THEIR USE

Laurence P. Folsom, Opt. D.

South Royalton, Vermont.

At the very beginning, let me say, that I plead guilty to the charge of presenting facts which are perfectly obvious to anyone who gives the matter unbiased consideration. In these days of a more exact optometry the more intelligent patients are no longer satisfied with vague explanations and excuses for our shortcomings. If then, a re-hashing of a few known facts will refresh our memories and promote discussion I feel justified in referring to them.

In the past ten years much valuable work has been done by optometrists toward the rendering of a better public service. Some of our number, I regret to say, still measure their ability to serve by the size of the total on the "plus" side of the ledger at the end of a business year, selling in many instances, a tinted ophthalmic lenses for the sake of an extra profit, when the patient would have been better off without them. Despite advances in training and skill optometrists are still obliged to shoulder too large an amount of public distrust. Let us, then, render an "Honest" service to our patients that we may receive in return the full public recognition which optometry so much desires and which it will receive just so soon as the individual members of our profession prove themselves entitled to it.

We believe the prescribing of tinted lenses has been greatly overdone and it is difficult to understand the reasoning of optometrists who, without thought of the patient's future, prescribe "this" or "that" tinted lens, often for no other reason than that the manufacturer recommends it (why shouldn't he?) and because the patient may think she needs them. Without doubt, much of the relief accredited to various tinted lenses is due to the artful suggestion of the one prescribing them. If a teaspoonful of "red" H2O every hour will cure an attack of "the grippe" and a pinch of pastry flour in a glass of water every night before retiring will cure an advanced case of insomnia, is it no wonder that a "pinkish" colored lens will work, in some cases, such splendid results.

That certain types of tinted lenses are needed and quite proper when the eyes of persons "raised" in the temperate regions are exposed to tropical heat and light we will admit. That certain occupations make the use of tinted lenses advisable is an established fact. But we are as yet unconvinced that any commonly used artificial light or natural daylight contains radiations either in kind or degree that are injurious to the healthy eye.

Daylight.

People have known for centuries that a certain amount of sunlight is essential for health and that persons engaged in occupations which keep them continually in the shade do not have the vigor, strength nor resistance to disease possessed by persons engaged largely in out-of-door work. We know that sunlight kills vermin and harmful germs; we know that rooms facing the sunny exposure are the more healthful rooms and that a bed-chamber must have at least some sunlight during the day in order to be healthful.

Invalids and consumptives are trotted out-of-doors into the sunlight for their health-giving sun-baths. We have long noticed that such patients gain more quickly and that all people feel the best when they have acquired a good coat of tan. It has been discovered that the curative rays of sunlight are largely cut off even by ordinary window-glass.

Only a short space of time back the beneficial effects of violet and ultra-violet rays were found. They were applied to the treatment of skin diseases, tuberculosis, cancer, etc., with much success, naturally by sunlight and artificially by electric lamps known to give off ultra-violet light.

When it was found that ultra-violet light accomplished so much good someone wondered whether X-rays, which are still shorter would not work

still better but experience showed that they would harm healthy tissue as rapidly as they helped diseased tissue and often did irrepairable damage. Then came the discovery of radium and its curative effects. The light emanated from radium is largely beyond the visible spectrum and it seems to possess a selective effect, healing diseased tissue without apparently injuring healthy tissue.

It was also found that the mercury-vapor lamp was even more rapid in its healing qualities than sunlight due to its greater content of ultra-violet radiation but severe burns often resulted. Later when the lamps were made up with quartz filters, the burning heat rays were removed and this trouble disappeared. In some locations where the sun seldom shines, quartz lamps have been used to make up this deficiency with much success.

WHY ALL OF THIS EXPLANATION REGARDING DAYLIGHT? Simply to refresh in our minds the fact that ultra-violet radiation is essential for health and even for life itself. What, then, is the value of designing tinted lenses to cut out these so-called "harmful" rays? Who says they are "harmful"?—only the distrbutors who have such lenses for sale. As a matter of fact, clear glass filters out a large portion of these rays. Do not misinterpret this. Some eyes, notably high myopes and those eyes which are diseased do need the relief afforded by tinted lenses but not in the manner generally believed, that is, by filtering out only the ultra-violet, and such cases are very few.

Artificial Light.

Some will say that tinted lenses are necessary because while daylight may not be harmful, artificial light is. Stop and think a moment. When you want to make artificial light as nearly as possible like daylight what do you do? You ADD VIOLET to it by using a violet glass bulb or filter and thus you reduce the emission of infra-red or heat rays. If any radiation is injurious in ordinary light by all means we will say it is the "heat" element. When we recall that the "sales arguments" generally proposed for pushing tinted lenses usually stress the need of filtering out the ultra-violet light, God's own beneficial and healthful light, we wonder if perhaps the criticism of the Chinaman that Americans are too busy "chasee the Almitee Dollee" isn't about right. We must not let a little extra profit entice us into doing a serious wrong to our patients.

Here you will raise the question that the present high-powered electric lamps might be injurious. If they are, it is only because they are not properly used or their light properly distributed. Certainly it is better to correctly use such lamps and thus correct trouble which may arise from this source. Practically no room or surface has as much light when lighted artificially as when lighted by ordinary daylight yet no one will consider average daylight to be too great in intensity.

The average brightness of daylight is over twice that of the electric arc and is sixty times as great as the average incandescent electric lamp. In some instances the light from an electric lamp may be reflected and condensed upon a nearby working surface to an intensity greater than daylight. We should bear in mind that a strong light quickly exhausts the rhodopsin and physiol and causes vision to become dulled and tiresome while a weaker light could be used with comfort over a longer period.

Light rays pass through the body to some extent but the heat rays do this to a greater degree than the ultra-violet which are absorbed near the surface of the body. In treating cancer, for instance, only those cancers at or near the surface are benefited by ultra-violet light treatment.

In experiments upon pig's eyes and upon the eyes of cattle while living an effort was made to produce lens opacities by radiant energy. The result was a pronounced failure after subjecting them to conditions more extreme than any to which the human eye is usually subjected and the conclusion was definitely reached that cataract or opacities of the crystaline lens of the eye can rarely be produced in the healthy eye by the visible spectrum or by ultra-violet light. It is common knowledge that the cornea and aqueous absorb most of the ultra-violet entering the eye and thus the lens and retina are by nature protected against these so-called "harmful" rays of the visible spectrum.

Taking, then, all of these factors into consideration, what impression do you receive of the national advertising of tinted lenses to the public direct through magazines of wide distribution thus pushing the sale of lenses most of the public do not need and would be better off without?

Conclusions.

In summing up the arguments regarding tinted lenses we reach these conclusions:

1. The ultra-violet rays, used as a sales-argument for the prescription of "tinted lenses" are not at all harmful but are in many ways beneficial.

2. That artificial light is usually much less in quantity nor does it contain as much ultra-violet radiation as daylight.

3. That, if any rays are fatiguing to the eye, it is the infra-red or heat rays which pass easily through ordinary glass. These are present in great quantities in certain occupations as arc-welding, glass blowing and foundry work and present the greatest eye-hazards in light. For these special lenses are designed.

4. That artificial light contains more "heat" radiation than daylight and that it may be improved in quality by the addition of violet rays and the filtering out of some of the "heat" rays.

5. That most people wearing tinted lenses would be equally satisfied with correctly fitted clear lenses.

6. That the number of cases actually needing commercial tinted lenses is very small and is confined largely to high myopes and diseased eyes.

7. That the attention of the optometrist of patients with photophobia should be directed to their lighting problems instead of to the sale of tinted lenses, and

8. That the advertising of any lens to the public direct is a reflection upon the intelligence and judgment of the practitioners who are expected to decide what lenses a patient shall or shall not wear.

CONVERSIVE HEAT IN OCULAR WORK

By G. L. DuPlessis, Opt. D.

Portland, Oregon

The use of electricity in ocular work is not new, though never widely used. Electro-thermo-cautery is one form. However there is another electro-medical-appliance which is rapidly gaining favor in medical practice, and that is diathermia or the production of internal heat in the tissues by a high frequency current. This heat is produced by the resistance of the tissues to the current while the electrodes or applicators remain cold and this heat causes an active hyperemia due to the increased circulation produced to remove the heat much the same as an auto-thermic control of water circulation in an automobile radiator controls the flow of water in an effort to keep the motor cool. Another of the many uses of this modality is electric knife surgery. The blade remains cold, but the heat produced in the tissues by the current divide them ahead of the blade so that no pressure is needed but the knife merely directed where the cut is to be made. Some of the advantages of this method is that an immediate hemostasis is produced, no blood lost hence there is no operative shock. The time required is very short compared with ordinary knife surgery and the coagulation of the tissues surrounding the cut produces a better aseptis than that of chemical agents. Without going into detailed explanations it may be mentioned that the use of the d'Arsonval current as of before and diathermia of today vary in that the latter is the product of practically undampened oscillation and produces much greater heat than the former. The other was more similar to a shocking machine than anything else while diathermia is absolutely devoid of shock and faradic effects if the machine is of suitable type. The subjective effect of diathermia is only a sensation of heat varying with the amount of current.

General contra-indications of the use of diathermia are any cases where an increase of tension would be detrimen-

tal or where the increased circulation to absorb the heat might also absorb toxins from infected areas. In other cases, while not always effective, it is at least harmless.

Electro-coagulation is the concentration of heat at a certain point in quantity sufficient to obtain coagulation of the tissues. If two electrodes of equal size are placed, one under the back and the other over the chest of a patient, heat will be generated in a plane equidistant from the two electrodes. But if the electrodes differ in size the heat will be produced nearer to the small one, and if this small electrode is further reduced in area, the heat intensity becomes greater and nearer until when a size is reached it will produce a coagulation or destruction of the tissues. Diathermia from medical, then becomes surgical. Coagulation by diathermia is entirely different from thermo-cautery as the point remains cold contrary to thermo-cautery where it is brought to incandescence. As can be readily seen, this apparatus for the production of heat of any desired degree at any desired point in the tissues must have a wide range of application in general medical practice.

Its use in ocular work is still in infancy. However physiotherapeutic literature mentions a number of pathologists which have responded to its use. It is of course indicated in the destruction by coagulation of growths and infected areas wherever cautery or electrolysis was indicated before. The action of diathermia in all the "itis" is to decompress by absorption of the exudates. In acute optic neuritis, treatment should be started early for best results and other therapeutics agencies such as quartz ray and ionizing doses of X-ray should be administered. When taken in time the relief from pain is rapid, a characteristic of diathermic treatments. The prognosis in the chronic type is not so good as much fibrosis may have taken place, diathermia, however, may reduce the fibrosis and restore function, hence for both the acute and chronic types it is the treatment of choice as there is nothing to lose and everything to gain. Iritis and retinitis are treated in the same manner with about the same results.

Diathermia should be found of use in all ocular affections where the production of an active hyperemia in or around the globe might be beneficial. Contra-indications of its use are exophtalmia and hemorrhages. Opacities and ulcers of the cornea, scleritis, choroiditis and other "itis" as well as glaucoma and cataract may be benefited. In glaucoma the relief from pain is rapid and according to certain authors the use of diathermia in acute cases may save the eye. Another interesting use of diathermia is for cataract. The theory of its action in these cases is that "the high frequency oscillations are transmitted to the tissues due to the ions whose orientation and movements are constantly modified by the current and which must produce a sort of molecular massage causing the draining out of used cells and their replacement by healthy tissue." At any rate a number of cases are reported where visual acuity was much improved in a sustained manner.

This use of diathermia is relatively recent (1922) and before a definite opinion can be formed, more research is needed. Another application of diathermia of which the author has seen no mention is in connection with muscular treatments, theoretically at least it must be beneficial, to what practical extent remains to be known.

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SUBJECTIVE VISUAL SENSATIONS AND THEIR INTERPRETATIONS

By Geoffrey Viner, M. D., F. R. C. S.

Being the

EIGHTH ETTLES LECTURE

With Full Report of the Meeting

from

The Refractionist

The Eighth Ettles Lecture was delivered by Dr. Geoffrey Viner, M. D., F. R. C. S., in the Lecture Theatre of the Royal Society of Arts, John Street, Adelphi, London, on the evening of Thursday, December 9th. The subject of the lecture was "Subjective Visual Sensations and their Interpretations." Mr. Owen Aves, Chairman of the Institute, presided over a very large gathering.

The Chairman, before introducing Dr. Viner, said that he was sure all those present would agree with him that the Ettles Memorial Lecture was one of the most important functions in the Institute calendar. It was his privilege to act as Chairman again on one of these occasions. He did not think that for many years they would be able to appreciate all that they owed to Dr. Ettles. In speaking to their Treasurer (Mr. Boatman) at the Council Dinner, Mr. Aves had referred to the remarkable success of the Refraction Hospital, and the Treasurer communicated to him a very interesting fact which, for the benefit of any Hospital students, he would pass on. Many years had passed since Dr. Ettles approached a number of opticians, asking them if they would assist him in hospital work; it was in connection with the Billingsgate Mission Hospital. He thought that the three opticians who had the privilege of assisting Dr. Ettles at the hospital deserved to have their names recorded in the annals of the Institute. They were Mr. Jacobs, Mr. Aitchison, and Mr. H. A. Bowman. That really was the first time in which opticians were officially, if he might say so, engaged in co-operating with ophthalmic surgeons in the work of rendering assistance to the poor of London. Although the Refraction Hospital was the first hospital which was definitely organized by opticians, it would, however, come as pleasant news to them, that long before the Refraction Hospital was started, the foresight of Dr. Ettles had made it possible for opticians to work in co-operation with him in hospital work. Dr. Ettles' ideas with regard to the development of their profession were, no doubt, well known to most of those present. On the last occasion, when he (Mr. Aves) had the pleasure of delivering the Ettles Memorial Lecture, he sketched out very briefly some of those ideas, and he would refer the younger members of the Institute to the copy of The Refractionist for those particular details. They had not time to go over the same ground, but he did want to impress on them that ten or fifteen years before, Dr. Ettles, acting as one of the Institute's most honoured Vice-Presidents, was most particular in emphasizing the fact that opticians should not only know their job as opticians, but that they should know the limitations of their work, and that they should be able to recognize quite clearly and definitely those cases which lay beyond their province. His own belief was that Dr. Ettles had some shrewd idea of the development which was likely to take place in the nationalization of medical service generally; and from a conversation that Mr. Aves had with him, he thought he knew more than most of them what was likely to happen in the future. They would remember that one of the quite revolutionary proposals of late years was the transfer of a certain amount of optical and ophthalmic treatment from the private practitioner, whether ophthalmic surgeons or opticians, to a number of Societies through the Na-

tional Health Insurance. That was quite as revolutionary in the way it affected the optical profession as was the introduction of the National Health Insurance in bringing about the present medical benefit system. Mr. Aves thought they would also agree that although a very great deal had been said on the question of National Health Insurance that still more light was necessary. The question as to who, eventually, was to administer ophthalmic benefit to over 15,000,000 insured persons had not yet been settled. But there could be no doubt that the difficulties in the way of a satisfactory solution were dissolving. He gave, as his authority for that statement, the experience of both medical men and opticians during the past six months, and recent authoritative statements in both optical and medical press. Since the greater responsibility for that particular work had been thrown upon the medical profession, they had realized that refraction was a difficult and complex matter, for which the usual general medical training was quite inadequate. If the 15,000,000 people, and more, were to have the best possible eye-service, it was becoming more and more apparent that the large body of trained and experienced and qualified opticians must be used to the fullest extent. Moreover, many ophthalmic specialists were beginning to realize the necessity for some adjustment of the problem. They were finding that the mere treatment of eye disease alone was inadequate, because the diseases were not always referred to them from quarters which they might quite legitimately expect. Opticians, on the other hand, were finding that when they did refer cases for medical treatment, that they did not always receive that amount of medical attention which the patient and the optician might legitimately expect; but the difficulties were disappearing. Mr. Aves was certain that the medical profession was getting more and more conscious that real specialist treatment was necessary, and that optical organizations were increasing the stringency of their examinations.

What he had been saying might seem to be far removed from the lecture, to which they were to listen; but he submitted to them that the presence of Dr. Viner was one of those auguries which spoke well for the future. When they remembered that in the past few years they had had such eminent authorities as Sir Arthur Leigh, Professor Elliott Smith, Dr. Dobson (who, he was sure, they were pleased to see present with them on that occasion), Dr. Critchley, Professor Stockford, and many others, all with medical degrees, and all anxious to help the ophthalmic optician in his work, and when again they had the pleasure of welcoming in their midst another member of the medical profession, Dr. Viner, he was sure they would agree with him that it was an augury for the real co-operation of the medical and optical practitioners in the future.

Mr. Aves then called upon Dr. Viner to deliver his lecture.

I.

FORM SENSE

Before passing on to the subject of my lecture tonight, "Subjective Visual Sensations and their Interpretation," I should like to take this opportunity of expressing my pleasure, and the privilege I feel, in being invited, as a medical man, by your Council to deliver this lecture; at the same time I am fully conscious that, with the limited time at my disposal, it is not possible to deal adequately with the many interesting problems that arise in connection with the special sense organ and I trust that I may be forgiven for many omissions. I think that we all owe the late Dr. Ettles a debt of gratitude, not only for his work as an oculist, but also for his endeavours to bring into closer contact the medical specialist and the ophthalmic optician, to their mutual advantage, and I imagine that the object of these lectures is to cement this spirit of co-operation by discussing some of the problems, common to both professions, from perhaps a somewhat wider aspect than is possible to the optician.

This is an age of specialism, and one of the great dangers of specialism is that the rest of the organism is lost sight of in concentrating upon one particular member of the whole. The eye is, to a very great extent, influenced by processes taking place in other parts of the body—this is true both in health and disease. There has been a tendency of late years in the medical profession to create what is known as

team work, i. e., the various specialists working together, should co-ordinate their results, and survey the patient and his infirmities from a generalized standpoint rather than from the contracted field of specialism. In the same way, I think, the two professions represented here tonight might bridge over the gap that exists in their respective researches by more frequent intercourse and exchange of ideas.

In general medicine, the first indication of a departure from health is a complaint by the patient of an unusual symptom, and this is especially true of an organ like the eye with its manifold disorders. The act of vision is an extremely complicated process; on close analysis it is made up of three distinct phases, physical, physiological and psychical. Everything relating to the formation of an image of an outside object upon the retina, i. e., everything pertaining to the refraction of the eye and to the transparency of its dioptric apparatus is physical. This retinal image cannot be passed on forthwith to the brain, however, because the optic nerve is not transparent. A vital process, therefore, is now brought into play; the light that formed the image decomposes a definite amount of a photo-sensitive substance in the retina, the visual purple, and is thereby converted into a nerve impulse which, traveling along the optic nerve, excites the special sensation in the visual centres. That problem in nerve conduction constitutes the physiological phase of the act of vision. The action of those two factors—physical and physiological—will not by themselves, however, induce sight. Before an object can be seen a physical phase must be reached when the sensation, induced by the nerve impulse, is interpreted by the brain; it is literally true that we see with our brains.

The exact significance of the description of symptoms varies enormously. Some we may dismiss as being of little value in diagnosis, others have the greatest possible import. We are sometimes apt, in listening to the history of the case, especially in neurasthenic subjects, to pass over, as comparatively unimportant, the patient's point of view of his own disability. By subjective visual sensations I mean symptoms given to us, with varying degrees of intelligence, which are not accompanied by any visible physical signs in our examination of the eye. In these cases we are inclined sometimes to deny the possibility of there being any pathological basis and assume that the symptom is either due to an optical delusion or else to excessive powers of imagination. In this connection we must remember that the eye is so sensitive that symptoms may arise before the pathological changes which produce them, are sufficiently gross to be detected even with our improved methods of the present day. It seems to me that the responsibility of making the diagnosis "functional" or "hysterical" as the cause of the symptom is far greater than assuming that it has a pathological basis even though this may not be apparent at the moment, e. g., metamorphopsia may occur in early lesions at the macula before it is possible to detect any change with the ophthalmoscope. I now propose to review some of the commoner symptoms and to try and estimate their value in making a correct diagnosis.

Some Symptoms Due to Derangements of the Form Sense.

Amblyopia (dimness of vision) or Amaurosis (loss of vision) may occur with or without involvement of the visual fields and may be unilateral or bilateral. There are several causes.

(1) Congenital Amblyopia. This is usually unilateral, with regard to the actual diagnosis it is important to establish that the defect dates from birth and remains unchanged by treatment (refraction, vision training), also that there are no pathological changes in the fundus, neighbouring organs (orbit, nasal cavities) or nervous system. Frequently other congenital anomalies are present, i. e., large errors of refraction, coloboma, albinism. Along with frequent Strabismus and marked reduction in central vision one finds in these cases normal adaptation to dark, normal colour sense and normal fields; in ninety per cent of cases, however, a central scotoma can be made out. I must here digress for a moment to say a few words about central scotomata or blanks in the visual field; when the patient is not conscious of anything intervening between him and the object looked at, the scotoma is said to be a negative one; when on the other hand

the scotoma is positive, the patient complains that a black spot covers everything he looks at directly, and if he gazes at the sky or a white wall, he sees a dark patch straight in front of him. This distinction between a negative and positive scotoma is of considerable clinical value, because the former implies a lesion of the retina or optic nerve whereas the latter indicates that the retinal elements subjacent to the lesion are intact, e. g., a superficial retinal hemorrhage will cause a positive scotoma and in these circumstances the patient sees the blood clot in his own eye.

In these cases of congenital amblyopia, therefore, with central scotoma, it appears that the macular region is not more sensitive to light than the rest of the retina, as is normally the case.

(2) Amblyopia Ex Anopsia.

From the point of view of treatment the distinction of this variety of congenital amblyopia is important, though in practice it is difficult. It is caused by psychical suppression of the retinal image in cases of Strabismus, cataract, etc.; that such a condition is possible is supported by the fact that normally we do not perceive the shadows of our own blood vessels on the retina, and again the experienced microscopist with both eyes open only sees the object which is being examined; by perimetry of the open eye which is not being used for microscopy it has been demonstrated that a central scotoma is present in this eye only, i. e., there is a temporary suppression of activity in the macular region.

In all unilateral squints of long standing it is the rule to find very defective vision in the squinting eye and this is best explained by prolonged suppression of the image; now in infancy the power of central fixation is lost very rapidly and therefore the earlier the onset of the squint the greater will be the amblyopia.

The distinguishing point between congenital A, and A ex anopsia seems to lie in the presence of binocular vision in the former in spite of the considerable amblyopia in one eye; in A ex anopsia binocular vision is very rare.

The vision of congenital cases cannot be improved by training, whereas up to the age of eight or nine years in cases of A ex anopsia much improvement may follow systematic training of the objective eye.

(3) Amblyopia Associated with Migraine.

Transitory subjective blindness with defects in the visual fields usually in the form of Homonymous Hemianopia is frequently encountered. The vision may be merely blurred or actual blindness may occur in both eyes lasting for periods varying from a few minutes to as long as a quarter of an hour. The half vision usually commences as a positive scotoma in the field of vision and gradually increases in size until half the fields are clouded, the fixation point remaining relatively clear; as it spreads outwards it has a peculiarly shimmering or vibratory character; in the dark field there are often seen bright spots and rays of various colours and these are often arranged in zig-zags, and are then called fortification spectra; if the first symptom is a central scotoma it may be very alarming to the patient; if he should be wearing glasses he will feel impelled to remove them to clean the lenses. The attack is usually followed by severe headache, which may be limited to the opposite side of the head to the Hemianopic Fields. Attacks occur periodically and vary very much in severity.

Most writers agree that these symptoms are caused by sudden spasms in the blood vessels of the brain, and although the symptoms are so strikingly ocular the cause lies in the nervous system. Some authorities maintain that migraine can be cured by correcting errors of refraction and muscle balance. Some undoubtedly can be, but not all and, therefore one should not be too optimistic as to the result of prescribing glasses.

The visual sensation of seeing flashes of light occurs in other conditions than migraine and may be of most serious import; it is frequently a premonitory symptom of detachment of the retina and is therefore very suggestive if there is a history of traumatism especially in a myopic eye.

(4) Amblyopia Associated with Hysteria and Neurasthenia.

These are very troublesome cases and occur both in children and adults.

The amblyopia may be mild in degree, in which case the symptoms consist of letters blurring and disappearing when reading, the eyes smart and water and headache ensues; when one examines the refraction it is frequently found to be emmetropic and the amplitude of accommodation is normal; the symptoms are due to rapid exhaustion of the accommodation.

Actual blindness of one or both eyes may occur, especially in females, the diagnosis being extremely difficult from cases of acute retrobulbar neuritis and here the pupil reactions are of great value.

Other symptoms met with in this condition are Monocular Diplopia, Polyopia, Ptosis, Macropsia and Micropsia.

In these functional cases valuable information can be obtained by examining the visual fields; they may take various forms; the best-known type are (1) the "elastic" field, i, e., it is smaller when taken out with a test object moved from the center to the periphery of the field than when moved in the opposite direction.

(2) Concentric contraction of the field, i. e., equally contracted in all meridians and "tubular" in type; in such cases when the field is taken at varying distances from the eye it does not enlarge in the usual way but always retains the same linear dimensions from the zero point.

(3) The "oscillating" field; here if the test object is moved slowly it is seen at one moment and not at the next and this phenomenon may explain the occurrence of a ring scotoma in hysteria; ring scotoma is usually found in organic disease such as retinitis pigmentosa.

(4) The "fatigue" field in which the tracing of the field appears coiled like a watch spring in consequence of its limits becoming concentrically smaller as the examination proceeds. Associated with these fields one may find inversion of the colour fields, e. g., field for red wider than that for blue. Some, if not all, of these curious changes in the fields are, to some extent, due to suggestion on the part of the examiner, at any rate in hysterical cases, in which condition, ideas too easily excite abnormal changes in the organism.

(5) Simulated Blindness

On account of the large number of injured eyes following accidents and the hope of compensation, it is not rare to meet with cases of simulation—only seldom is total blindness complained of, on account of the difficulty in carrying out the design, and the relative ease with which it can be detected. So that partial amblyopia is the common form we encounter. This may be the feigning of total or partial blindness in one eye or exaggerated loss of vision in both. Quite similar are the symptoms of hysteria, which must always be excluded.

When there is lack of agreement between the results of our functional testing and the objective examination, we should immediately become suspicious, yet observe carefully, so that the patient will not be aware that he is even under suspicion. If amaurosis is claimed, the first thing we look for is the pupillary reaction, which, if present, should make us gravely suspicious. The facial expressions are important and should be carefully watched when the light is thrown upon the eye.

The patient is told to look with the blind eye at his own hand which he holds in front of him. A blind man will not hesitate to do this, since he knows the position of his hand by the sense of feeling. A malingerer will purposely look in the wrong direction. A pencil held between the sound eye and a book will conceal certain words if the other eye is blind, but if the second eye is good it does not interfere with the reading as he unconsciously reads with the other eye. A prism of 8° base down over the apparently blind eye will produce vertical diplopia and the patient cannot read with it; he will also be unable to walk steadily about the room or upstairs with this prism over the eye on account of the diplopia produced. Next make the patient look at a vertical line with a dot on it and he will see two dots, one below the other; with one eye blind he could only see one dot.

We should always take the field of vision and repeat it to see whether it corresponds; first take it with the affected eye bandaged and then with both eyes uncovered; should the affected eye not see it will naturally not

interfere with the second field taken and the two fields will correspond with each other. It is the cases of exaggerated feebleness of sight that tax our observation greatest, and so here especially we must depend upon repeated examinations, each of which should correspond and, most important of all, the malingerer should never know that he is under suspicion.

Perhaps it will not be out of place to say a few words here on the condition known as **Word-Blindness.** This occurs not very rarely in children as a congenital defect. It is six times commoner in boys than in girls, and is shown to be present when it is found exceedingly difficult or impossible to teach a child with healthy eyes, normal acuity of vision and good general intelligence, to read sometimes even common words of one syllable, although he can learn to recognize them if allowed to spell them aloud; music can as a rule be read and he is often quite good at arithmetic, but he fails to recognize printed or written words, on account of backwardness at school he is often sent for some suspected visual defect; the condition runs in families. These children should not be sent to school. A great deal can be done for them by careful individual tuition. This defect is probably due to imperfect development of the center for visual memory in the left side of the brain.

Muscae Volitantes and Photophobia, or dislike of bright light, are two subjective symptoms which are frequently functional in origin. Muscae consist of grey specks and motes seen floating in the field of vision, especially on looking at a uniformly bright surface, e. g., page of print. They follow the movements of the eye, but will not stand, so to speak, "being looked at." They are caused by embryonic cells and fibres in the vitreous seen entoptically; physiological muscae are not visible with the ophthalmoscope; they often occur in myopes, which is explicable by the fact that in a short-sighted eye anything that casts a shadow produces a sensation; physiological muscae are usually grey and semi-transparent (never black) and require a certain amount of attention to recognize them. Nervous, excitable or hysterical subjects may be thrown into a state of great anxiety by their appearance. Eye-strain by making the eye hypersensitive may cause them to appear, and so may ill-health by causing neurasthenia and general hypersensitiveness of the nervous system.

Photophobia, or increased sensibility to glare, is frequently encountered as a troublesome symptom without any physical signs to explain its origin; it has a very varying significance and before condemning an individual to the use of tinted glasses one should endeavor to find out the cause of the complaint. (1) It may result from prolonged eyestrain, due to any form of ametropia and will disappear when suitable glasses are prescribed. (2) It may be part of a general hypersensitiveness of the nervous system, i. e., neurasthenia, which is so amazingly prevalent at the present time. (3) It may be caused by defective pigmentation of the eye, which may be short of actual albinism, especially in blondes with blue eyes, fair hair and complexion, of northern ancestry who also have defective pigment in the iris and choroid and it is important to remember that this defective pigmentation may be present in the eye without a corresponding defect showing in the hair or skin. Subjects with fair hair which becomes darker as they advance in years, may still continue to have defective pigmentation in the choroid. This last group of cases, i. e., defective pigmentation should always use tinted glasses for constant use, but in cases due to eyestrain and neurasthenia they should only be used for the glare of excessive sunlight or artificial light; if they are used for other purposes than these it will be found that they will soon lose their effect and darker and darker tints will be required.

Curious changes in the refraction of the eye sometimes occur. Rapid alterations in the refraction of the eye are sometimes found in cases if diabetes, in the absence of the more serious affections of the eye which one meets with in this disease. These alterations are presumably due to changes in the refractive power of the lens—in most cases the change is towards myopia and it varies with the amount of sugar taken by such a patient; if the blood is kept sugar free by excluding it from his diet the myopia will disappear; if, on the other hand, the patient becomes

careless about his diet the blood sugar increases and he will become myopic again. If this occurs in a patient over fifty years of age with presbyopia the effect will be that on some days he can read without his glasses, on others he will require them; the changes have been as much as seven dioptres. A case has been reported of a man who rapidly developed a myopia of two dioptres with a return to normal in ten days. Occasionally the change is towards hypermetropia. I have recently seen a man, thirty-seven years of age, the subject of diabetes, who had a total hypermetropia of 2.5 d. in each eye. He was medically treated and put on a strict diet; seen two months later, his total hypermetropia in each eye was no more than 0.5 E. Difficulty in reading is a frequent complaint in diabetes; it is the result of defective power of accommodation. The same condition is sometimes met with as an early symptom of Glaucoma.

II.
LIGHT SENSE

Symptoms caused by disturbance of the Light sense or adaptation of the eye to varying degrees of illumination. In considering the dioptric condition of the eye we recognize a positive and negative phase of accommodation according to the increase or diminution in the refractive form of the lens. So we can divide adaptation into dark adaptation and light adaptation according to whether the eye is more sensitive to faint light stimuli, or on the contrary, the sensibility is reduced. Generally speaking, we find the eye in an intermediate state of adaptation and it can readily accommodate itself in both directions to the needs of the moment.

The slow improvement of vision in the dark has long been known. Goethe refers to it in his work on colors in the following words: "He who goes from the light of day into a darkened place, at first recognizes nothing, but little by little, the sensibility returns to the eye, more quickly for strong stimuli than for weak, the former in a minute, the latter in seven to eight minutes," and again, "Prisoners who have long languished in darkness acquire so great a sensibility of the retina that they are able to recognize objects in the dark."

The facility with which normal individuals see in dim illumination varies within rather wide limits and those with myopia of any considerable degree are usually especially defective in this respect. The rods and cones in the retina must be regarded as the functioning unit of the eye and they are nourished by the blood vessels of the choroid; whenever the capillaries of the choroid are congested, the proper nourishment of the rods and cones is at once interfered with, and as a result, a greater intensity of light is required to produce a sensation in the retina. Now the feeblest light capable of causing a sensation is known as the light minimum, and it is always increased by changes in the circulation of the choroid which starve the rods and cones. On the other hand, disturbances in the retinal circulation which tend to starve the ganglion cells and nerve fibres cause an increase in the light difference or the power of perceiving the difference in illumination between two discs of light, one of which is gradually darkened.

Increase in the light minimum is the earliest symptom of glaucoma. It is only after the optic nerve becomes injured by increase of intra-ocular pressure that the light difference becomes affected. An increase in the light minimum is usually accompanied by color blindness for blue which may take the form of a central scotoma; both these symptoms are likely to occur in congestion of the chorio-capillaris and treatment prescribed with the object of reducing that congestion will restore sight to normal in less than a month.

In scotopic vision (or vision in the dusk) the rods are much more sensitive than the cones and inasmuch as cones predominate at the macula adaptation is less here than at the periphery. Defective dark adaptation of the eye results in Night blindness or a disproportionate reduction of vision in dim light; such patients in daylight can see comparatively or absolutely well, but as soon as twilight sets in they see very badly or not at all; the origin can be ascribed to pathological changes in the rods, particularly a failure in the visual purple or its defective regeneration. There are various causes for Hemeralopia or Night blindness, but it frequently occurs without any

ophthalmoscopic signs, it is then called Essential Hemeralopia, and we presume a defective nutrition of the retina by the choroidal blood vessels in which the rods suffer more than the cones, being more highly specialized and therefore more vulnerable; this disturbance of nutrition may be congenital and this occurs about equally in the two sexes—acquired forms also exist due to general causes such as general debility, malnutrition, and protracted convalescence; not only the quantity but also the quality of nutrition can have considerable influence in causing hemeralopia; when the diet is deficient in vitamines and fats the damaging influence is especially great. Hemeralopia was observed in a gymnast who took severe physical exercise and was a rigid vegeterian; he was given another diet chiefly of milk and eggs for four days, and the hemeralopia which had been present for a month, disappeared.

In diseases of the liver, jaundice, and malaria hemeralopia is liable to occur; alcoholism is also a powerful factor in these cases. Along with the general nutritional disturbances already mentioned, are local conditions producing dazzling of the eyes and causing hemeralopia. A painter is recorded as being Night blind after painting the white facade of houses; on changing his work the symptoms disappeared.

Hemeralopia is purely a local condition due to abnormal retinal fatigue as is shown by the fact that covering one eye with a bandage during the day will, in sailors with this condition, restore sight enough for the ensuing night's watch on board ship, the unprotected eye remaining as bad as ever. The macula region is affected first and recovers last; at the commencement of their affection patients complain of a central scotoma on entering a dark room; later the defect in adaptation spreads over the whole fundus; the visual acuity is normal but there is often a contracted field for blue so that small dark blue objects, for example, cornflowers in a field, would appear black to the hemeralope and this is also the case in a normal eye after exposure to the glare of a strong light.

A form of night blindness which has no physical cause is sometimes experienced by long-sighted persons who are obliged to wear strong convex glasses constantly; they should be advised to discontinue their glasses in the dark.

III.

COLOR SENSE

Subjective visual sensations arising from disorders of the color sense must now be considered.

We must distinguish carefully between color blindness, i. e., a defect in or absence of the normal trichromatic color vision, and the so-called chromatopsias where the whole field appears suffused by a definite color tone; this can be artificially produced by putting a colored glass before the eyes and the particular discoloration taken as the basis of the color impressions received from surrounding objects. Let us deal with the latter first. The best known form of chromatopsia is corythopsia or red vision. This often occurs in soldiers after a march over snow mountains of a definite height above sea-level. Fuchs recalls the following from Schaubach's "Deutchsen Alpen": "The party, after climbing the Grossglockner and a long march over the snow had again reached the rocks; all felt somewhat dazzled. Schaubach handed over to his guide a large piece of beautiful red quartz which he had found; next morning in the valley when he wished to surprise his companions with his prize, it proved to be as pure white as the driven snow."

Erythropsia was formerly considered to occur almost exclusively after cataract operations but they only produce a condition favorable to its development, since all cataract cases do not exhibit the phenomenon; an abnormally large pupil will predispose an eye to the occurrence of erythropsia just as aphakia does. The exciting cause is practically always a strong exposure to light rich in ultra-violet rays; this probably acts by upsetting the normal adaptation of the eye for the red tinge entoptically produced in the retina by the passage of light through the blood vessels on its way to the rods and cones, an abnormal hyperaemia of the retina being excited by the exposure to bright light as it is in the skin. Red vision also occurs sometimes in neurotic school children who are hypermetropic and overstrain

their eyes with reading; they notice that the print suddenly becomes red; here again the probable explanation is that the congestion of the retinal blood vessels upsets the normal adaptation of the eye for the red tinge produced in the rod and cone layer of the retina, but in addition an abnormal state of nervous irritation is a factor in its production. A bright blue vision frequently occurs after cataract operations and may be very alarming to nervous subjects; a good idea of this sensation can be obtained if a yellow gelatine screen be placed before the eyes and worn for some time, then suddenly removed—immediately every object observed will appear tinged with blue; this is due to successive contrast; as in this case so in the blue vision after cataract operations it is obviously the successive contrast which causes the color disturbance. While the opaque lens is in the eye it only allows the faint yellow tones to pass through the eye to the retina, whereas when the lens is removed the other rays will reach the back of the eye unhindered, and then, in contrast, the blue tone elements in the color will be specially prominent.

Xanthopsia, or yellow vision, occurs in jaundice, after exposure of the eye to strong electric light, and in cases of infection by intestinal parasites when the drug Santonin has been administered even in quite small doses as a remedy.

I will now pass on to the subject of color vision and color blindness. Color has three distinguishing features:

(1) Hue or tone, depending upon the wave length of the light providing it.

(2) Intensity or brightness.

(3) Saturation or amount of mixture with white light, e. g., the colors of the spectrum are fully saturated, i. e., they contain no white light.

Now in order to obtain the entire color system by the mixture of spectral colors he must select at least three primary colors, e. g., red, green and violet. On this basis the color system of the normal individual is called Trichromatic.

Appreciation of colors occurs only with light of moderate intensity and when the eye has been adapted to some degree of lightness; vision with the light adapted eye is called Photophic and the cones are probably the organs for this, the rods being functionally in abeyance. On the other hand, if a spectrum of low intensity is viewed with the eye adapted for darkness it will appear as a grey band which merely differs in brightness in different parts.

If we picture to ourselves the light over a landscape gradually fading, when it has fallen below a certain level, the perception of color fails altogether and everything will appear grey just as a photograph appears to us; this is known as Scotopic or twilight vision and it is probably carried out through the mediation of the rods alone; under these conditions the eye behaves as though it was totally color-blind. Too vivid an illumination also diminishes the power of discriminating colors; as the intensity increases so chromatic sensibility becomes increasingly fainter and is finally lost.

It may therefore be said that clear, distinct, chromatic sensations only occur with light of moderate intensity; with shorter or weaker light they may become achromatic.

The relative brightness of colors, again, changes considerably with the degree of illumination; yellow, orange and red are the brightest colors in ordinary daylight, while, with the same degree of illumination, green, blue and indigo appear comparatively dark. On the contrary, in twilight, yellow, orange, and above all, red becomes dimmed while green and blue are relatively bright. The color sensibility of the eye is not equal over the whole of the retina—it is greater at the macula and decreases thence to the periphery; the most peripheral parts being color-blind.

Broadly speaking vision with the dark adapted eye is monochromatic or tone free and vision with the light adapted eye is polychromatic or tonal.

Color blindness may be congenital or acquired. When congenital it may be partial or complete.

Total color blindness is very rare and is always associated with Nystagmus and amblyopia due to a central scotoma.

All colors appear grey in the spectrum which varies in brightness in its different parts; this is precisely the same as the vision of a normal eye

adapted for darkness which fails to perceive colors if the illumination sinks below a certain level.

It is probable that total color blindness depends upon defective development or complete absence of the retinal cones.

Partial color blindness is seldom discovered unless specially tested for, since the subjects compensate for their defect by attention to shades and texture, combined with experience. Marked cases occur in three to four per cent of males and less than half per cent in females. The condition is inherited and is transmitted through the female who is usually not color blind. Cases may be divided into two main groups: (1) the Red-Blind who see the red end of the spectrum much less bright than normally and the red end may be actually shortened while green and blue are rather brighter than to normal people.

(2) The Green-Blind, who cannot see green as a color—in the spectrum the line of bluish green would appear a colorless grey. These two groups are very closely allied and to those affected with either, all hues which the normal person would distinguish as red, orange, yellow, or yellowish-green, appear the same color, i. e., yellow but with varying degrees of brightness. These cases are explained on the supposition that one pair of primary colors (i. e., red and green) is absent while the other pair (blue and yellow) is present.

All the hues that can be perceived by a person who is partially color blind can be produced by mixing two of the spectral colors; this color system is therefore dichromatic. There appear to be a great number of transition forms between red or green blindness and the normal trichromatic vision. These are called anomalous Trichromates and they may be said to have merely a weak color sense; they are uncertain of the colors red and green if the visual angle is small, the colors not quite saturated, or if only a short time is allowed for the observation; a common mistake with these people is calling a white light green if it is next to a red light. To these people also violet and blue, orange and red are difficult distinctions.

If the anomalous Trichromates are included in the percentages of partial color-blind cases met with, we find that about ten per cent occur in males and one per cent in females, proportions which make their detection of considerable practical significance, especially since in all other respects they appear to have normal vision.

It is of the utmost importance that those connected with railways and marine services should have normal color vision. Treatment is usually unavailing but recent work indicates that at any rate in the anomalous trichromates (or those with reduced color sense) if the defect is discovered early enough, systematic training may succeed in developing color sense—hence the importance of examining the color sense in children. The clinical examination of a patient's color vision is not a scientific investigation into his color sense; it has for its object merely to ascertain whether the patient sees substantially normally and can be relied upon not to confuse colors which are obviously different to the normal sighted, e. g., red and green.

In testing for danger only, it is obvious that the names given to the colors are of value, for if a man repeatedly calls red green or vice versa, he is clearly unsuited to be an engine-driver or look-out man on a ship.

As regards individual tests, several should be employed since no single test is infallible; in the more difficult cases the test with a pure spectrum should be employed, in ordinary cases the critical test should be carried out with a color lamp, since most occupations demand that the observer should be able to recognize lamps. I think that the three best tests are:

(1) The wool test, consisting of a large number of colored skeins of wool, and three test skeins of definite colors. The patient is instructed to pick out from the collection, wool of substantially the same color as each of the test skeins which are given to him one at a time; the collection of wools consists of about twenty different colors, each color in eight shades; as an alternative method the patient is told to grade the whole 160 skeins in groups of the same color and varying in shade from dark to light. The test must be carried out in daylight.

(2) Stilling's book of colored lithographic plates in which bold numerals are picked out in colored dots of vari-

ous tints. Normal trichromates can easily read the numbers, some of which are indistinguishable to the various types of color-blind.

(3) The lamp test is carried out with the color lamp in a darkened room; the patient looks at the lamp or its reflection in a mirror and is shown the light through glasses of various colors; much here depends upon the size of the apertures of the lantern and the nature and intensity of the source of illumination.

Acquired color blindness is usually due to pathological changes in the eye or brain. In most diseases of the retina and choroid, e. g., retinal detachment, the changes in color perception affect mostly the blue end of the spectrum; slight diminution in the acuity of perception of these blue rays is caused normally in adult patients owing to their physical absorption by the increase of amber pigment in the nucleus of the lens which takes place with advancing age. This produces the so-called blue blindness and its effect has been especially noticed in the pictures of artists in their old age.

Tobacco and alcoholic amblyopia causes profound changes in the color sense—the symptoms are typical, there is a gradually increasing mist before the eyes so that he cannot recognize friends when he meets them in the street, and may add that he is shocked at the appearance of his friends, they look so ill and "corpse-like." He may also say that he sees best in a dull light; that in a bright light he is easily dazzled; a whitish or yellowish mist rises like a cloud in front of the eyes and prevents him from seeing properly. Towards sunset, however, this sense of dazzling disappears and in consequence he can always see best in the evening; he may also spontaneously complain that his color sense is disordered, and testing will show that while he has, in the peripheral parts of the field of vision no difficulty in distinguishing red and green, he is in the central area unable to detect these colors—red appears brown and green appears white. As the disease progresses, these always assume a metallic lustre, red is said to "glitter like gold" and green to appear "like silver"; in some cases blue is strikingly predominant so that a bunch of sweet peas is thought to be made up of blooms of different shades of blue.

Ladies and gentlemen, it only remains for me to thank you for listening so patiently to my remarks, and if I have in any way aroused your interest, or stimulated you to enquire more fully into these problems, I shall not have spoken in vain.

DISCUSSION

At the close of the lecture the chairman said he was sure that their complaint would not be that Dr. Viner had not aroused their interest, but rather their complaint would be that he had roused their interest from so many points that they were left in the difficult position of having to review a very wide area in a very short space of time. One of the visitors had asked particularly that time should be devoted to questions. Speaking for himself he could only regret that the lecture was not delivered at eight o'clock in the morning, so that they might have the rest of the day in session in dealing with the very wide area which Dr. Viner had covered. He had himself quite a series of questions to ask Dr. Viner, but at the same time, he felt he would rather that the audience should have an opportunity of bombarding the doctor.

In the earlier portions of the lecture he was certain that every practicing optician would be intensely interested because they were problems with which he had to deal. The question of congenital amblyopia and the various phases of exophoria, they were questions which the average man would have to make decisions upon. The lecture was full of suggestions. One of the questions which particularly interested him was the difference between congenital amblyopia and amblyopia ex anopsia. Dr. Viner had mentioned that one of the best distinctions was the presence or absence of binocular vision. He would like to ask Dr. Viner if he had found the average test of the stereoscope was satisfactory, or whether he did not feel, as he had often felt, that some other test was more necessary in general practice; whether he thought that the binocular tests were sufficient.

Dr. Viner said he thought the average test of the stereoscope and Scroll's pictures were very unsatisfactory, and

he would welcome, personally, something much more up-to-date, but he had not discovered it so far. When he referred to binocular vision in those cases of congenital amblyopia he naturally meant that there was a very low degree of binocular vision in congenital cases, and nothing approaching stereoscopic vision; but that in the other cases the low grade of binocular vision was not even present.

Dr. Dobson told of an interesting case which she had. About four weeks before she had to remove a cataract from the right eye of a lady. She noticed when she removed the cataract that it was extremely yellow in colour. When after five or six days the bandages were removed from the eye of her patient, the patient only saw things that were blue. The nurse wore a cornflower blue dress, and all the patient could see was a big cornflower blue mass walking about. The wall of the room, which was yellow, she could not see at all. She could see anything that was blue, but nothing of any other colour.

Mr. Miller referred to the physiological muscae, and asked whether they should be black, or perfectly opaque.

Dr. Viner said that what he meant to convey was that the physiological muscae were usually grey and semi-transparent. If they were black, it was much more likely that they were pathological. The actual colour was of importance. The state of transparency was of importance.

Mr. Dadd said it was rather curious the difference in the percentage of ten per cent male and one per cent female in the question of the colour blindness. Did Dr. Viner attribute that largely to the extra smoking in men, or did he think it was largely a physiological difference as regards sex? Dr. Viner had also mentioned the question of the wool test. He took it that that was not so much adopted at the present time. In a certain railway district a number of men were being turned down by the railway on that test. But he had lent a friend of his a colour lantern, and almost all the men were passed. The result was that five out of six of the men were reinstated when they were passed by the lantern test.

Dr. Viner, in reply to Mr. Dadd, said that none of these cases of partial colour-blindness, when examined, showed any of the clinical characteristics of acquired colour-blindness due to tobacco or alcoholic excess. It was certainly not due to smoking. He could not give any explanation as to why it was much more predominant in males than in females. With regard to Holmgren's wool test, he had particularly tried to emphasize in his remarks that none of these colour tests were individually infallible. That was why it was wise to use at least two if not three. Many writers had said that the Holmgren wool test would let a good many people through who ought not to get through. But if it was used with other tests he thought it was a most useful way of finding out what the patient's colour vision was worth.

Mr. Russell asked whether, in cases of migraine, there should be a reference as a matter of course to the ophthalmic surgeon.

Dr. Viner said that one of the first and most important things was to correct the error of refraction and the muscle balance, and he had not the slightest doubt that an optician could do this as well as an ophthalmic surgeon. What he had tried to bring to their notice was that the treatment should not stop there. A great deal of good could be done in cases of migraine by medical treatment as well as by treatment confined to the eye.

The chairman said that with regard to this last question quite a number of doctors in his district, treating migraine, asked for an optical report. Then, if the general practitioner's treatment, plus the optician's work, was not sufficient, further specialist treatment was recommended.

Dr. Viner said that personally he thought the treatment that an ophthalmic surgeon could give in a case of migraine was very limited indeed—in other words, that the condition of the eyes had very little to do with the onset of the attacks. It was more a general medical matter than a matter for the ophthalmic specialist.

Mr. Tillett, referring to the lecturer's remark that diabetic patients were subject to changes in the refractive power of the eye, asked whether the change of axis of the astigmatic could be attributed to any particular cause or disease.

Dr. Viner said that he had never

seen an astigmatism change in cases of diabetes, though it was quite possible that cases did occur, seeing that these observations on changes of refraction in diabetic cases had been made only during the last ten years or so, although, of course, they must always have existed. Further observations were needed before the question which had been put could be answered.

Mr. Dadd asked whether many changes in astigmatism had been observed to occur in epileptic cases.

Dr. Viner said he had not observed them.

Mr. F. Thompson said that some years ago he read a book by Dr. Berry on diseases of the eye, and the author seemed to be very much in doubt as to whether alcohol had so much effect in amblyopia as was supposed. The lecturer, however, had mentioned alcohol poisoning and tobacco poisoning in the same breath, and he thought the opticians would agree that the two without a doubt did go together. If a man took an extraordinary quantity of whisky and was a smoker he was likely to have amblyopia to an extent which he would not have had if he had merely smoked tobacco and had not taken alcohol.

Dr. Viner agreed that the effect of alcohol was quite as important as that of tobacco, or even more. As a medical man he knew that excessive alcohol lowered the resistance of the whole organism, not only to microbes, but to deleterious poisons of any kind, and it was only reasonable to suppose that if the patient was poisoned with alcohol this resistance was lower than it ought to be; then the toxin in tobacco came along, and attacked the cells in the retina which had been already made more vulnerable owing to the abuse of alcohol.

Mr. Capel said that the lecturer had mentioned, with regard to the symptoms in retrobulbar neuritis that the pupil responding to light swung back again. Was that an unvarying symptom in his experience?

Dr. Viner said that he was afraid it was not an invariable sign, but it had a good deal of value in distinguishing the two conditions, namely, acute retrobulbar neuritis and hysterical amblyopia. A better test, perhaps, was the presence of a central scotoma, partial or complete, in the case of acute retrobulbar neuritis; a central scotoma was most unusual in hysterical cases. That was a more valuable test than the pupil reaction, although the pupil reaction would help to some extent.

Mr. Colebrook asked whether there was any characteristic pupillar appearance in toxic amblyopia. Was the pupil larger or smaller than the average size for the age of the subject?

Dr. Viner asked whether Mr. Colebrook was referring to the chronic or the acute condition.

Mr. Colebrook said that he referred to the acute.

Dr. Viner replied in the negative. He thought there was no constant change either in the size of the pupil or in its reactions. Ocassionally, in bad cases, one did get a larger pupil on the affected side, and a pupil in which the light reaction was not sustained, but this was variable, not constant, and therefore not to be depended on.

Mr. Staples asked whether apparent flashes of light in the eye were always a nervous symptom.

Dr. Viner said that flashes of light in the eye might be a very serious symptom, by no means necessarily a symptom of migraine. It might indicate, as he had said in his lecture, threatening detachment of the retina; it also occurred in those very insidious cases of cyclitis in which the vision was a little misty, but not very much. He had seen patients read 6/5 with an eye which, when examined at close range, had got the most definite evidence of cyclitis. So one had to be very careful in these insidious cases of cyclitis in which the patient complained of seeing flashes of light. It was really due to the pull of an inflamed ciliary body upon the anterior parts of the retina.

The chairman, there being no more questions, called upon Mr. Dadd to move a vote of thanks to the lecturer.

Mr. Dadd said that it gave him the greatest pleasure to propose a vote of thanks. He had heard a good many of these Ettles Lectures, he thought almost every one, but he did not think that any lecture always excepting the one which the esteemed chairman gave last year, furnished so much food for thought. There were many points which would not be grasped until the

lecture was read at leisure. The lecturer had pointed to fields of research, which opticians should study more than they had done in the past, and he was glad that the Institute was going ahead with this question of research.

Mr. Lidiard seconded the vote of thanks. He had been interested in the problems which the lecture had suggested on the borderline of the physiological and psychological aspects of vision. There had been until recently a tendency to forget, not merely the psychological, but to a great extent some of the less obvious physiological aspects, and if Dr. Viner's lecture had stimulated a number of those who were non-medical refractionists to a consideration of some of the more obscure points in the visual processes which happened behind the retina the present occasion would have been not merely interesting but profitable.

(Applause.)

The vote of thanks was carried by hearty acclamation.

Dr. Viner, in responding, said that it had been a great pleasure to him to come and lecture to such an appreciative audience.

CASE OF CHANGE OF REFRACTION DUE TO DIABETES

M. Steinfeld, Opt. D., F. A. A. O.

Paducah, Kentucky.

The announcement in our daily papers of a recent death, calls to mind the most interesting case of great changes in refraction caused by diabetes, which I have ever seen, or of which I have read.

While changes of a half or one diopter are to be expected, the refraction in this case changed several diopters in a short time.

Miss M. B., a school teacher, aged about 45, was sent by her physician, in August, 1923, because of blurred distant vision. She complained that her vision had become very bad at a distance, but could see to read as well as ever. Examination showed that a —2.75 D. Sph. was required for each eye to maintain normal distant vision. The physician was called and confirmed the suspicion of diabetes. As a sister wears a pair of —5.00 D. Sph. her statement that she had always seen perfectly at a distance was doubted and some myopia, increased by the diabetes, was suspected. She was given a pair of —1.00 D. Sph. for temporary wear. Two months later she complained that she could not read, and it was found necessary to give her a pair of +3.50 D. Sph. for reading. The distant vision at this time required about a +1.50 D. Sph. About one week later the reading glasses were reduced one-half diopter. Two months later she was given O. D. +1.50 D. Sph., O. S. +2.00 D. Sph. for reading which she used until her death. Her distant vision was practically normal without correction. During this time she was under constant treatment which probably kept her system free of sugar and the refraction stationary.

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DR. JACK I. KURTZ, Room 209 Yeates Building, Minneapolis, Minnesota.

The Journal has no objection to the reprinting by other magazines of any of its articles, provided such reprints are properly credited to the American Journal of Optometry.

THE POST-REFRACTION

It is regretable but nevertheless true that too many ocular examinations are made in a hurried manner. Very few patients can be successfully refracted in one short visit to an optometrist's office. It is true that most those so fitted may not come back "kicking" but it is also true that very few so refracted will be favorably impressed with the examiner's thoroughness in painstaking care.

With the one possible exception of the simple presbyope and even then surely not all of these, all cases should be examined at least on two occasions before an ocular prescription is written. This will tend to eliminate errors, due to faulty technic or omissions due to a reception room filled with waiting patients.

As has been said all Refractions should be so made as to cover two visits to the office, the routine being somewhat as follows: On the first visit the patient's name, address, occupation and history is recorded. Next a record is made of uncorrected, visual acuity, followed at once by a tonicity test made while patient is still uncorrected. The external ocular inspection is then made followed by an ophthalmoscopic examination. The fields of vision are then charted on the perimeter and if necessary the stereocampimeter is used and a record made of the corneal curvatures as shown by the ophthalmometer. Static skiametry findings are then recorded along with the check-test dynamic readings, taken with fixation at the static working distance. The case is then dismissed with an appointment for a post-refraction for the following day. When the patient again appears, for the post-refraction, the static findings are again taken, followed by the subjective tests. The patient's near point of accommodation is taken being immediately followed by the subjective positive accommodative test and a record of her or her reading of working distance made. The dynamic skiametry findings are taken at this point, it being the fixation distance and the near-point correction worked out. This is followed by the usual tonicity and duction tests and if advisable by some of the worsted-color tests, preferably the Jennings. The record chart is now carefully reviewed and a diagnosis made. It is in most cases well to explain this diagnosis in lay language to the patient and to at this time also make a prognosis as to the results of your work. The patient is now instructed when to return for another examination—say 6 months or a year

as the case may require and the prescription for the material is written. By following some such routine a balanced and painstaking refraction will result and all matter of interest to the examiner will be known.

Few patients will object to returning on the following day to complete a refraction and most patients will appreciate your efforts for accuracy.

C. C. K.

PRICE ADVERTISEMENT

"I see in your Journal of February issue that New York was the first state to pass a ruling in regards to 'price advertisement.' This is wrong.

"The Maryland Board in June, 1926, passed a ruling that we would consider the advertisement of the price of lenses unethical practice and cause for the revocation of a license. Every Optometrist in Maryland was mailed this ruling and from that time until now price advertising of lenses by optometrists has been discontinued.

"Other State Boards have the power to make similar rulings and as you state in your editorial, Optometry must clean its own house."

Yours very truly,
Signed B. W. Hazell, Pres.
Board of Examiners of Optometry,
Maryland.

The above letter by Dr. Hazell is self-explanatory and in a splendid way shows what an Optometry board, having a stiff back-bone can accomplish. None of the mid-western boards have, as far as we know as yet, attempted anything of this kind, yet an action of this kind is just as feasible and just as proper in the mid-west as it is on either coast. We repeat, Optometry boards were created for only two reasons—they being, first to serve the public by eliminating the unfit and second, to better Optometric conditions for those in practice. More power to those boards and may the day soon come when they will fully enforce the ethical practical clauses of their respective laws.

C. C. K.

A MODEL OPTOMETRY ACT

The following Resolution, while somewhat humorously written, was seriously offered and passed at the recent convention of the Minnesota State Association of Optometrists:

"Whereas, it is generally acknowledged that Optometrists are poor lawyers, and

"Whereas, it is quite openly admitted that most optometry acts are the "Brain Children" of Optometrists rather than lawyers.

"Be It Resolved, that we, the Optometrists of Minnesota, in convention assembled, do hereby petition the American Optometric Association, our parent body, to have drafted a model Optometry Act to serve as a guide for the profession in the future, and

"Be It Further Resolved, that we do also petition the aforementioned body to select, former secretary of state, Charles E. Hughes, to draft, out of his great wisdom, this bit of Legislation."

The need for action of this kind is obvious and surely it should fall to the lot of our large national organization to perform this duty. A year never passes without modifications being made to, and amendments being passed on, the optometry acts of some of our states and much of this troublesome and thankless work could be avoided by having some sort of a standard or model act for all the state associations to pattern after. The resolution is a good one and the A. O. A. should at once take cognizance of it and set in motion the machinery to carry out its provisions.

C. C. K.

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

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Reports of Society Proceedings in Delaware should be sent to Dr. M. Burton Meyer, 101 West Eighth St., Wilmington; in Iowa to Dr. D. A. Kinney, Charles City; in Maryland to Dr. J. F. Andreae, Baltimore; in Minnesota to Dr. J. A. Large, Winona; in Nebraska to Dr. C. A. Perrigo, Freemont; in North Dakota to Dr. A. S. Anderson, Williston; in Oklahoma to Dr. E. B. Alexander, Duncan, and in Vermont to Dr. L. P. Folsom, So. Royalton.

THE EYESIGHT PROTECTION LEAGUE OF CALIFORNIA

The Eyesight Protection League (of California) organized by leading optometrists of the state during 1925, is rapidly expanding. Applications from a number of optometrists of Southern California were received by the League following its first meeting in that section, held at the Elks Temple in Los Angeles on February 7th.

Among the members of the organization are practically all the "old timers" in Optometry who were instrumental in getting the state law upon the statute books in 1903. These men organized the Eyesight Protection League to act in the interests of public eyesight and in the defense of Optometry.

Membership now blankets California, all sections being represented. Another objective of the league is to increase its roster to include many optometrists who may or may not be affiliated with their state body.

H. S. Marshutz, Opt. D.,
Correspondent.

THE MINNESOTA CONVENTION

The twenty-seventh annual convention of the Minnesota State Association was held on February 14th and 15th at the Radisson Hotel at Minneapolis.

Dr. Nordland, the president, opened the convention at 10 a. m., the 14th of February. He delivered the address of welcome, also discussed briefly some of the problems confronting optometry. He was followed by Dr. Thomas G. Atkinson, who delivered a very interesting lecture on "Eyes and the Man." During the convention Dr. Atkinson also lectured on the following subjects: "Relation of Eye Diseases to Refraction," "Making of Clinical Records," and "Practical Aspect of Color Vision." Other speakers of the convention were Drs. L. L. DeMars, who lectured on "Applied Optometry," and Dr. W. B. Needles, who spoke on "Diseases Due to Overaccommodation" and "Successful Optometry."

Two eye talks were broadcasted, one by Dr. E. H. Kiekenapp and the other by Dr. Wm. B. Needles. The entire banquet program was broadcasted over Station WAMD. This began at 6:30 and lasted until midnight.

The officers elected for the current year are: Drs. Jos. L. Frank, New Prague, president; C. C. Koch, Minneapolis, 1st vice president; Alfred J. Large, Winona, 2nd vice president; Henry Watzke, Morris, 3rd vice president; Earl Jones, St. Paul, 4th vice president; J. I. Kurtz, Minneapolis, secretary, and Arthur Norstrom, Minneapolis, treasurer.

The new officers are planning to put on a postgraduate course during the year to last from one to two weeks.

Plans are also being worked out now to carry on an extensive legislative campaign for the next two years. Also steps are being taken to give special attention to the enforcement of the optometry law throughout the state.

MINNEAPOLIS OPTOMETRIC ASSOCIATION TO MEET

The Minneapolis Optometric Association will meet the 16th of March at 6:30 p. m. Dr. Wm. Mendelsohn of the Cameron Specialty Company will deliver an illustrated lecture on "Ocular Myology."

Dr. Mendelsohn will lecture on the same subject before the St. Paul Optometric Association on the 14th of March.

THE TENNESSEE CONVENTION

The twenty-sixth annual convention of the Tennessee Optometric Association was held the 14th and 15th of February at Knoxville.

The convention was opened by Dr. R. S. Davis, the president of the Knoxville Optometric Association, who welcomed the delegates. He was followed by Dr. W. Ruth, the president of the Tennessee State Association, who spoke at great length, discussing the problems which are confronting the profession at present as well as some speculations about optometry's future.

A variety of lectures marked the educational program. J. H. Mitchell spoke on "Success in Practice." Dr. Edvin F. Tait of the Pennsylvania College of Optometry lectured on "Analysis of Ocular Muscle Data" and "Dynamic Near Point Test." E. A. Forshay took as his subjects "Corrected Lenses" and "Importance of Muscle Tests." Dr. Carl F. Shepard lectured on "High Visibility in Optometric Science." Dr. Vance C. Ray read a paper on "Presbyopia," and Dr. L. L. Whittington lectured on "Values."

The convention closed with a banquet at the Whittle Springs Hotel.

The officers elected at the convention are: Drs. Tom Pritchett, Knoxville, president; J. H. White, Nashville, 1st vice president; C. H. Harris Jr., Chattanooga, 2nd vice president; V. C. Ray, Memphis, 3rd vice president; R. M. Davis, Knoxville, 4th vice president; W. Fred Gates, Chattanooga, secretary-treasurer.

FOR SALE—Only exclusive optical store eastern Nebraska town 12,000. Rich farming country. Good location, business and equipment. Large list of case records. Best of reasons. Address, P. O. Co. c/o American Journal of Optometry.